(12) UK Patent Application (19) GB (11) 2 257 910 (13) A

(43) Date of A publication 27.01.1993

(21) Application No 9120247.3

(22) Date of filing 23.09.1991

(30) Priority data
(31) 9109147 (32) 24.07.1991 (33) DE

(71) Applicant
Kaltenbach & Voigt GmbH & Co

(Incorporated in the Federal Republic of Germany)

Bismarckring 39, 7950 Biberach, Riss,
Federal Republic of Germany

(72) Inventors
Eugen Eibofner
Rolf Pritsch

(74) Agent and/or Address for Service
Haseltine Lake & Co
Hazlitt House, 28 Southampton Buildings,
Chancery Lane, London, WC2A 1AT,
United Kingdom

(51) INT CL5
A61L 2/26, F16K 17/12

(52) UK CL (Edition L)
A5G GAA G108
F2V VA6 VW18
U1S S1025 S1185

(56) Documents cited
GB 2123528 A

(58) Field of search
UK CL (Edition K) A5G GAA, F2V VA6
INT CL5 A61L 2/06 2/26, F16K 17/12

(54) Pressure relief valve for a steam sterilizer

(57) A steam sterilizer, in particular for medical instruments, comprises a heatable container and a cover forming a pressure-tight seal therewith. In the cover 3 there is a pressure relief valve which comprises an annular valve housing 10 of elastic material inserted into a hole 18 in the cover. Inside the valve housing are a valve seat 11 and a valve body 12 which rests on the valve seat and has a dependent peg 13a carrying a tensile weight 17. The weight has, in at least one direction transverse to the longitudinal direction of the peg, *a width that is greater than the diameter of the hole in the cover* into which the valve housing is inserted. If excessive pressure develops and the valve housing is forced out of the hole in the cover, the weight engages behind the hole and prevents the valve housing from being shot out at high speed.

In an embodiment the peg 13b extends upwards to a disc 14, the purpose of which is to ensure that steam escaping from the pressure relief valve is diverted laterally rather than upwards which might result in injury to an operator.

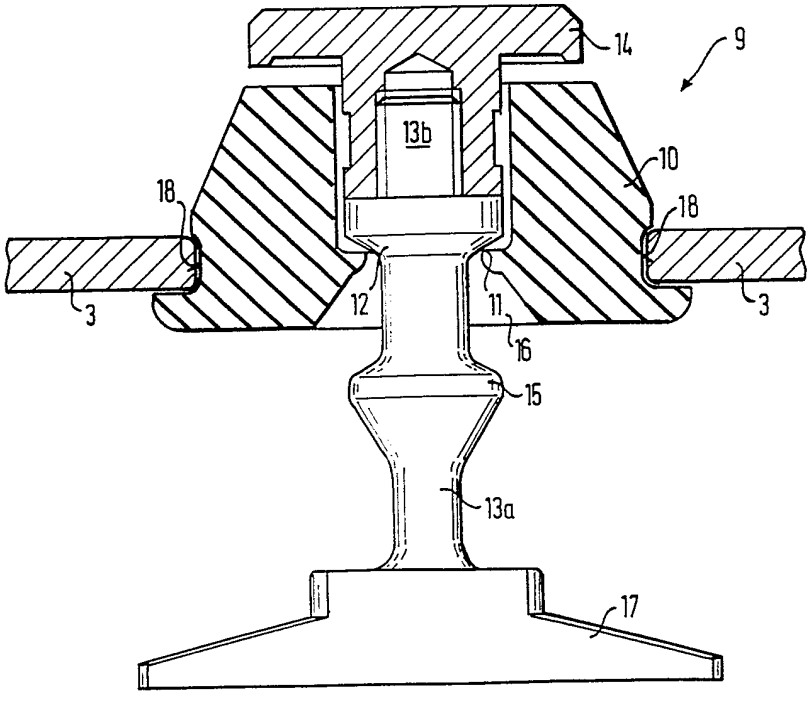


FIG. 2

GB 2 257 910 A

FIG. 1

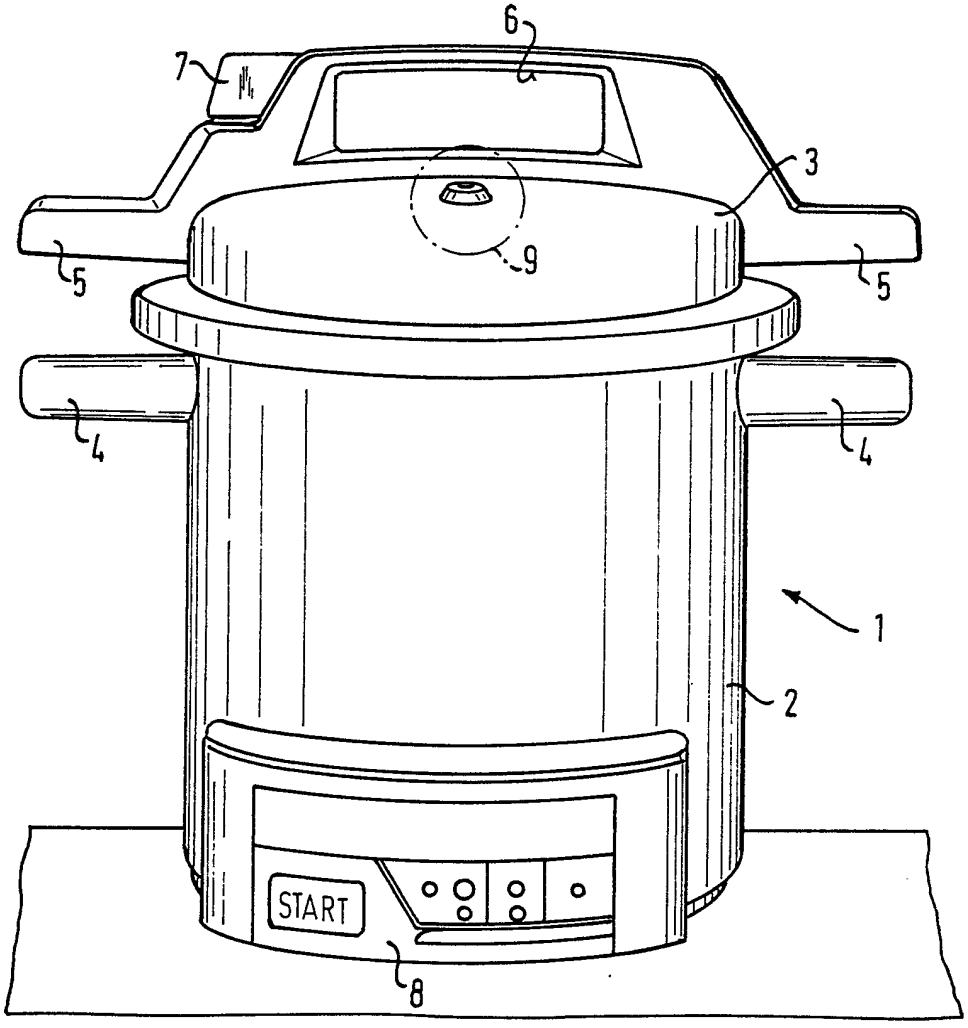


FIG. 2

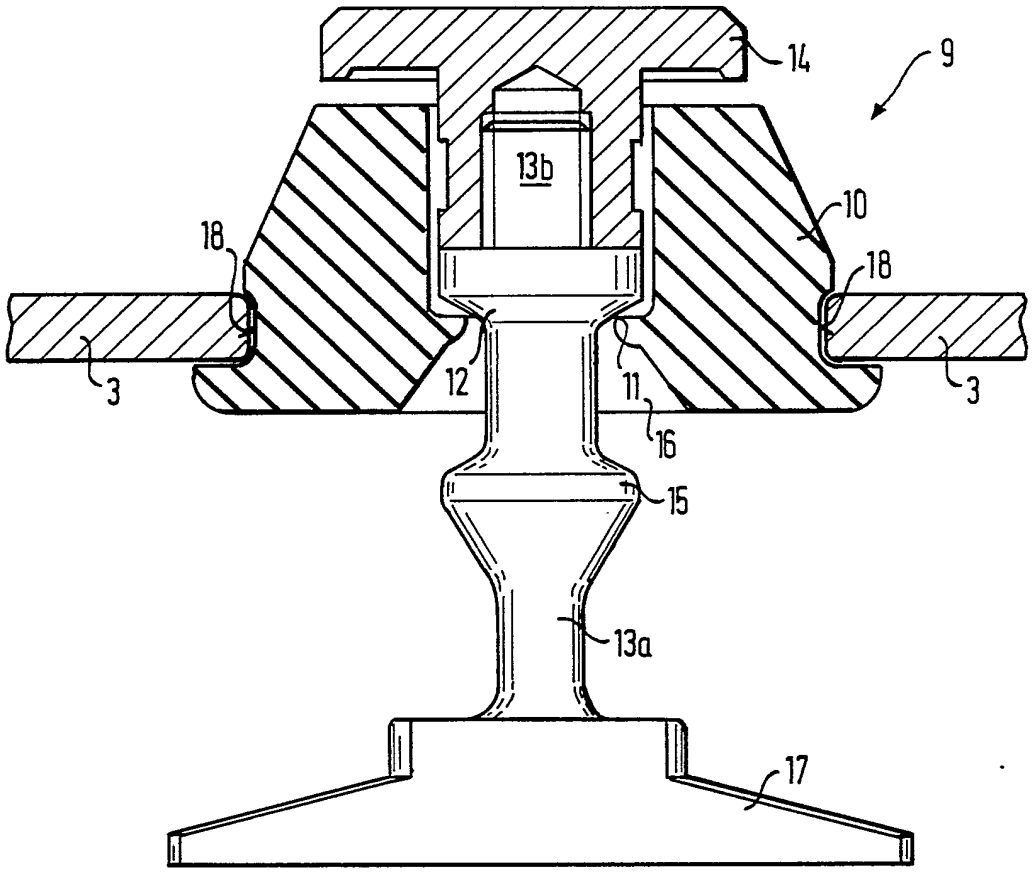


FIG. 3

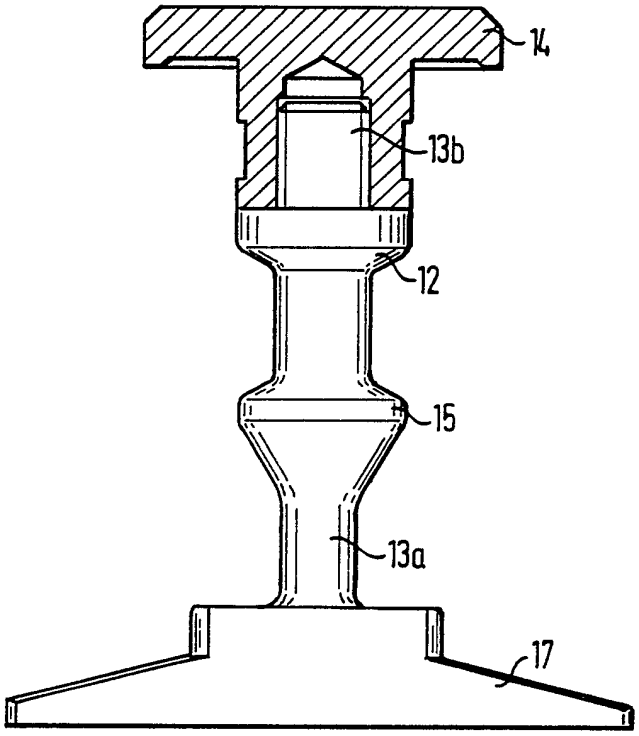


FIG. 4

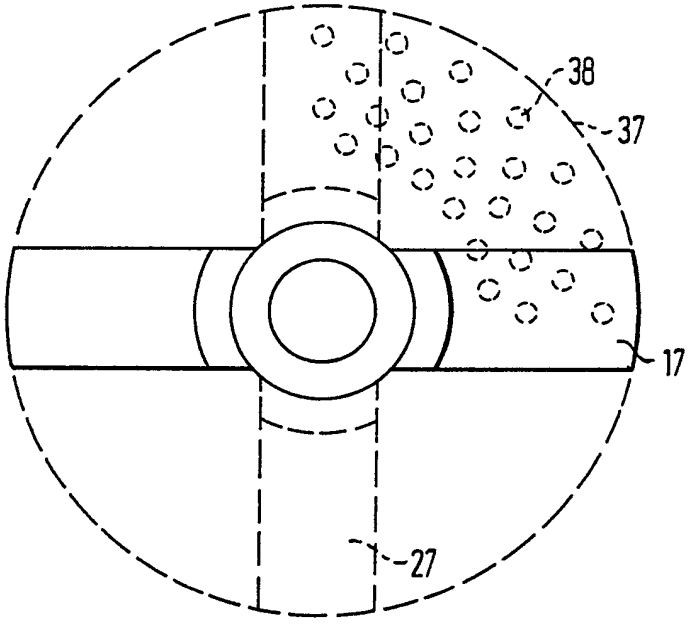


FIG. 5

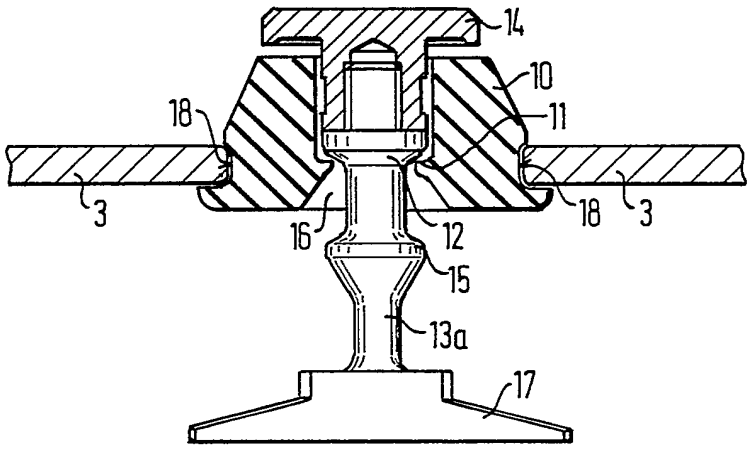


FIG. 6

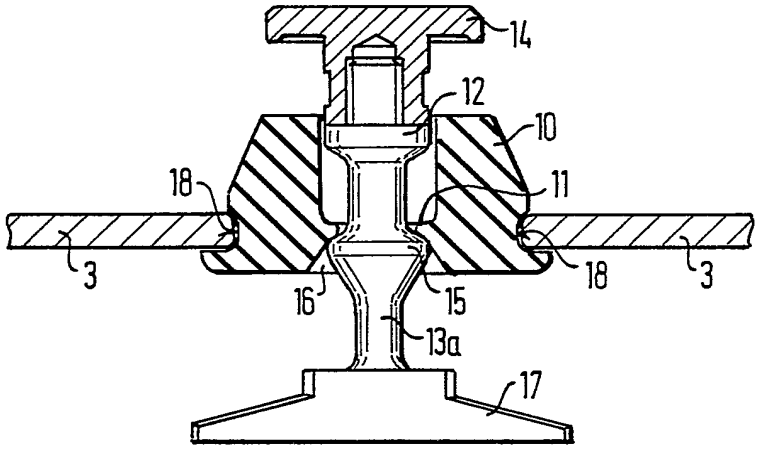


FIG. 7

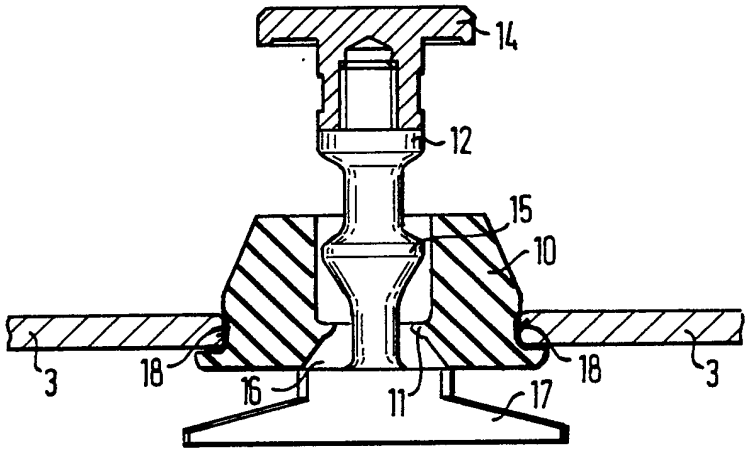
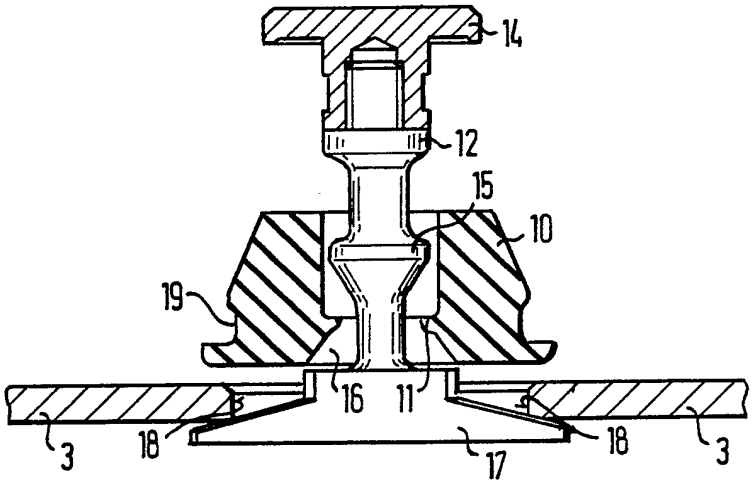


FIG. 8



Steam Sterilizer

The invention relates to a steam sterilizer, in particular for medical instruments or the like, comprising a heatable container, a cover that makes a pressure-tight seal therewith and a pressure relief valve in the cover which is made up of an annular valve housing of elastic material inserted into a hole in the cover and having the valve seat therein, and a valve body in the valve housing which rests on the valve seat and includes a dependent peg carrying a tensile weight.

A steam sterilizer of this kind is known in which the valve housing consists of rubber and has an annular groove on the outside with which it is press-fitted into the hole in the cover. The diameter of the weight is approximately equal to half the diameter of the hole in the cover in which the valve housing is located. It has now been discovered that if a very high pressure is developed the valve housing and the valve body can be shot out of the hole in the cover like a bullet.

It is an object of the invention to avoid this danger.

This object is achieved by making the width of the weight in at least one direction transverse to the longitudinal direction of the peg greater than the diameter of the hole in the cover into which the valve housing is inserted.

The solution according to the invention ensures that, in the event that the valve housing is forced out of the hole in the cover by the development of excessive pressure, it is prevented from "shooting out" because the weight engages behind the hole in the cover.

In a practical embodiment of the solution according to

the invention the weight may have the form of a cross-bar or a plate. If it is in the form of a plate, this should be perforated so that the plate does not completely seal the hole in the cover.

In the known steam sterilizer the peg extends upwards from the valve body as well as downwards. At the upper end there is a red coloured head which protrudes from the valve housing when pressure is relieved by the pressure relief valve and indicates this state. A further advantageous embodiment of the present invention consists in providing, instead of said head at the upper end of the peg, a disc which extends transverse to the longitudinal direction of the peg. When steam is released this disc prevents steam from flowing upwards and possibly injuring an operator. The disc ensures that the steam escaping from the pressure relief valve is diverted laterally.

To ensure the lateral diversion of the steam escaping from the pressure relief valve the distance between the upper side of the valve housing and the disc should not be too great. As a further improvement in the concept described above, it is therefore proposed that the peg should have a thickening between the valve body and the weight for limiting the upward movement of the disc.

Exemplary embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 shows the steam sterilizer;
Fig. 2 shows the pressure relief valve in section;
Fig. 3 shows the valve body with the peg and weight;
Fig. 4 shows three variants of the weight viewed from below on Fig. 3;

Fig. 5 shows the pressure relief valve in the closed position;

Fig. 6 shows the pressure relief valve with the valve body lifted;

Fig. 7 shows the pressure relief valve with the valve body lifted even further;

Fig. 8 shows the pressure relief valve with the valve housing pushed out and the valve body held fast.

The steam sterilizer 1 shown in Fig. 1 comprises a container 2 that is open at the top and a cover 3 that can be placed thereon to form a pressure-tight seal. There are two handles 4 on the container 2. There are two handles 5 on the cover 3 and an upper (operating) handle 6. In order to put the cover 3 on and take it off the handles 4 and 5 must be offset at an angle to one another. To lock the cover in a pressure-tight manner the handles 5 must be brought over the handles 4. There is a pressure relief valve 9 in the cover. A rotatable knob 7 is also provided on the cover by means of which steam can be released from the steam sterilizer. The working parameters such as temperature, pressure and sterilizing period can be set by a control unit 8.

A valve housing 10 of rubber forms part of the pressure relief valve 9 shown in section in Fig. 2 on an enlarged scale. The valve housing 10 is rotationally symmetrical and has a vertical through hole which is narrowed at one point to form a valve seat 11. On the outside of the valve housing 10 there is an annular groove 19 (see Fig. 8) by means of which the valve housing 10 is press-fitted into a hole 18 into the cover 3. In the valve housing 10 there is a valve body 12 which, in the normal state, is seated on the valve seat 11. A peg 13a extends downwardly from the valve body 12 and carries a weight 17 at its bottom end. A part 13b of the peg also extends

upwards beyond the valve body 12. A disc 14, spaced from the upper side of the valve housing 10, is screwed on to the peg part 13b. The downwardly extending peg part 13a has a thickening between the valve body 12 and the weight 17. Beneath the valve seat 11 the valve housing 10 has an opening 16 that is tapered conically towards the valve seat 11.

Fig. 3 again shows the valve body 12 with the two peg parts 13a and 13b, the plate 14 and the weight 17 separately.

In Fig. 4 a view of the weight 17 from below is shown. This comprises here a cross-bar extending transversely to the longitudinal direction of the peg. Alternatively a double cross-bar 27 or a plate 37 having openings 38 can be provided. In all versions the width of the weight in at least one direction transverse to the longitudinal direction of the peg is greater than the diameter of the hole 18 in the cover (see Fig. 2).

In Figs. 5 to 8 different operating states of the pressure relief valve are shown. Fig. 5 shows the pressure relief valve in the normal position in which the valve body 12 is pulled downwards by the weight 17 so that the valve body 12 rests on the valve seat of the valve housing 10 and no steam can escape from the steam sterilizer.

Fig. 6 shows the possible situation that the steam pressure in the steam sterilizer has lifted the valve body 12 from the valve seat 11. In the lifted state steam can usually escape from the steam sterilizer. The steam escaping at the top from the valve housing 10 is diverted laterally by the disc 14. The highest possible position of the disc 14 in the normal blow-off state is limited by the thickening 15 of the peg 13a, which abuts from below against the constriction in the valve housing 10 forming

the valve seat 11.

Fig. 7 shows the possible situation in which, through still further increase in pressure, the thickening 15 is pushed through the constriction in the valve housing 10 forming the valve seat 11.

With an even greater increase in pressure the state shown in Fig. 8 can then arise, in which the valve housing 10 is pushed out of the hole 18 in the cover 3. Further outward movement of the valve body 12 with the valve housing 10 is, however, not possible as the weight 17 engages behind the cover 3 at the edge of the hole 18.

Claims

1. A steam sterilizer, in particular for medical instruments or the like, comprising a heatable container, a cover that makes a pressure-tight seal therewith and an pressure relief valve in the cover that is made up of an annular valve housing of elastic material inserted into a hole in the cover and having the valve seat therein, and a valve body in the valve housing which rests on the valve seat and includes a dependent peg carrying a tensile weight, characterised in that the tensile weight has, in at least one direction transverse to the longitudinal direction of the peg, a width that is greater than the diameter of the hole (18) in the cover into which the valve housing (10) is inserted.

2. A steam sterilizer according to claim 1, characterised in that the tensile weight has the form of a cross-bar (17), a double cross-bar (27) forming a cross or a plate (37).

3. A steam sterilizer according to claim 2, characterised in that the plate (37) is perforated.

4. A steam sterilizer in which the peg also extends upwards beyond the valve body (10), characterised in that the peg (13b) carries at its top end a disc (14) transverse to the longitudinal direction of the peg.

5. A steam sterilizer according to claim 4, characterised in that the peg (13a) has a thickening (15) between the valve body (12) and the tensile weight for limiting the upward movement of the disc (14).

6. A steam sterilizer substantially as hereinbefore described with reference to Figures 1 to 8 of the accompanying drawings.

AMENDMENTS TO THE CLAIMS HAVE BEEN FILED AS FOLLOWS

1. A steam sterilizer, in particular for medical instruments or the like, comprising a heatable container, a cover which makes a pressure-tight seal therewith, and a pressure relief valve in the cover comprising an annular valve housing of elastic material inserted into a hole in the cover and having a valve seat therein, and a valve member in the valve housing having a valve part mounted on a stem and resting on the valve seat, the stem including a depending part carrying a weight at or near its lower end, the weight having, in at least one direction transverse to the longitudinal axis of the stem, a dimension that is greater than the diameter of the hole in the cover, wherein the stem projects above the valve part and is provided at its upper end with a disc mounted transverse to the stem axis.

2. A steam sterilizer according to claim 1, wherein the weight is a bar, a double bar, forming a cross, or a plate.

3. A steam sterilizer according to claim 2, wherein the plate is perforated.

4. A steam sterilizer according to claim 1, 2 or 3, wherein the stem has a thickening between the valve part and the weight for limiting the upward movement of the disc.

5. A steam sterilizer substantially as hereinbefore described with reference to Figures 1 to 8 of the accompanying drawings.

-8-

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number

9120247.3

Relevant Technical fields

(i) UK Cl (Edition K) A5G (GAA);F2V (VA6)

(ii) Int Cl (Edition 5) A61L 2/06,2/26; F16K 17/12

Search Examiner

S J QUICK

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

16 JANUARY 1992

Documents considered relevant following a search in respect of claims 1-6

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2123528 A (THE PRESTIGE GROUP) see whole document	1 & 2 at least

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

Published 1993 at The Patent Office, Concept House, Cardiff Road, Newport, Gwent NP9 1RH. Further copies may be obtained from Sales Branch, Unit 6, Nine Mile Point, Cwmfelinfach, Cross Keys, Newport, NP1 7HZ. Printed by Multiplex techniques ltd, St Mary Cray, Kent.